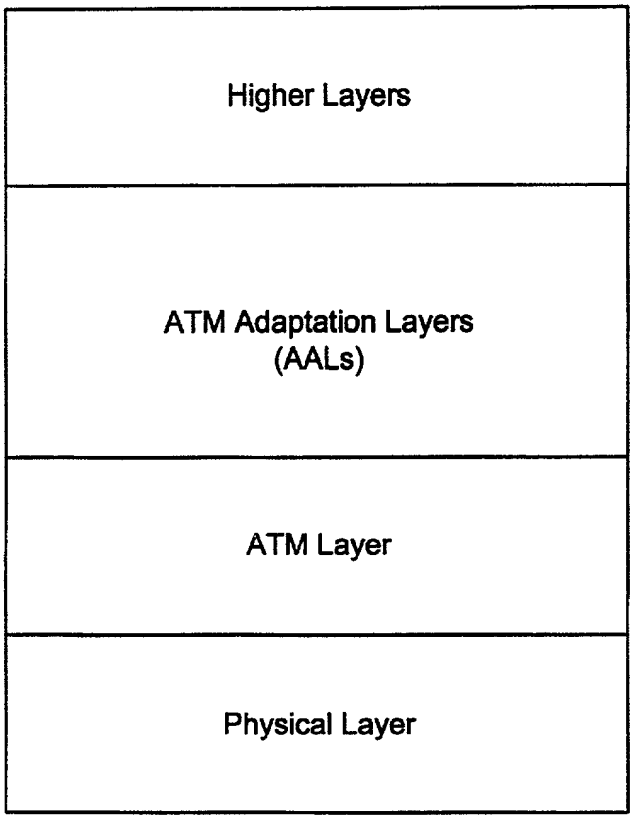
Higher Layers
ATM Adaptation Layers
(AALs)
ATM Layer
Physical Layer

Fig. 1

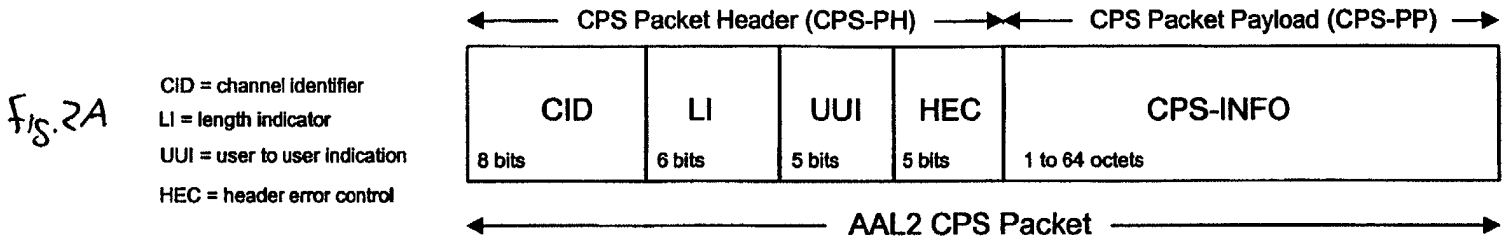

Fig. 2A

CID = channel identifier
LI = length indicator
UUI = user to user indication
HEC = header error control

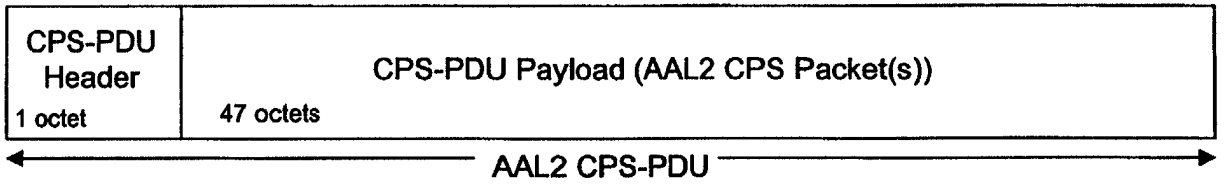

Fig. 2B

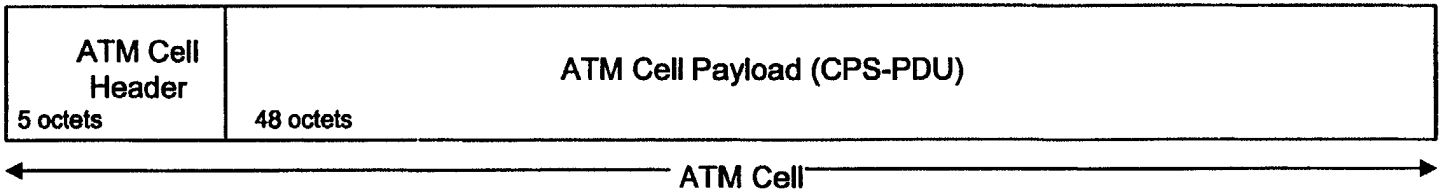

Fig. 2C

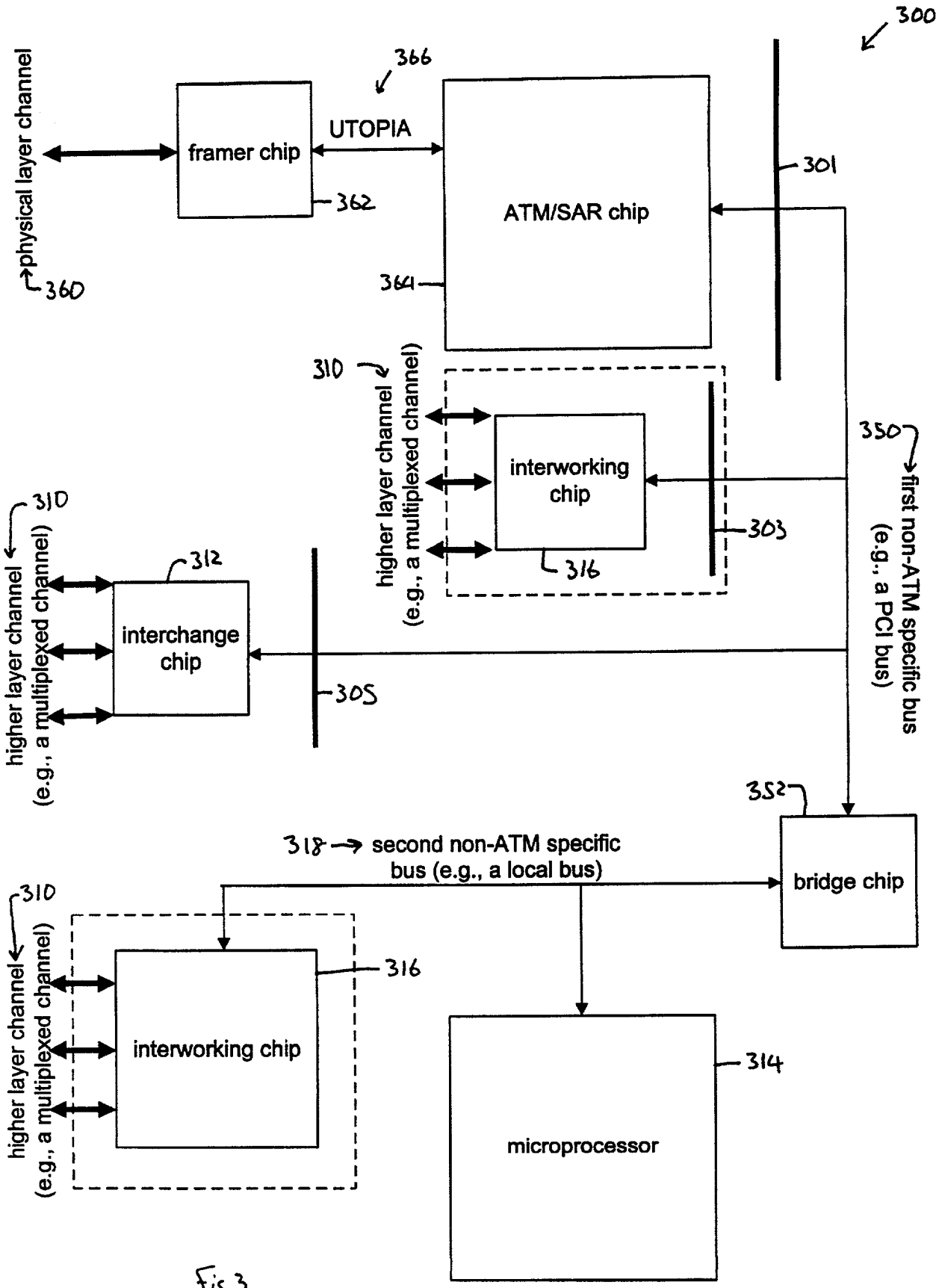
300
366
physical layer channel
framer chip
UTOPIA
362
360
ATM/SAR chip
301
364
310
higher layer channel
(e.g., a multiplexed channel)
interworking chip
316
303
350
first non-ATM specific bus
(e.g., a PCI bus)
310
higher layer channel
(e.g., a multiplexed channel)
312
interchange chip
305
352
318
second non-ATM specific bus (e.g., a local bus)
bridge chip
310
higher layer channel
(e.g., a multiplexed channel)
316
interworking chip
314
microprocessor

Fig.3

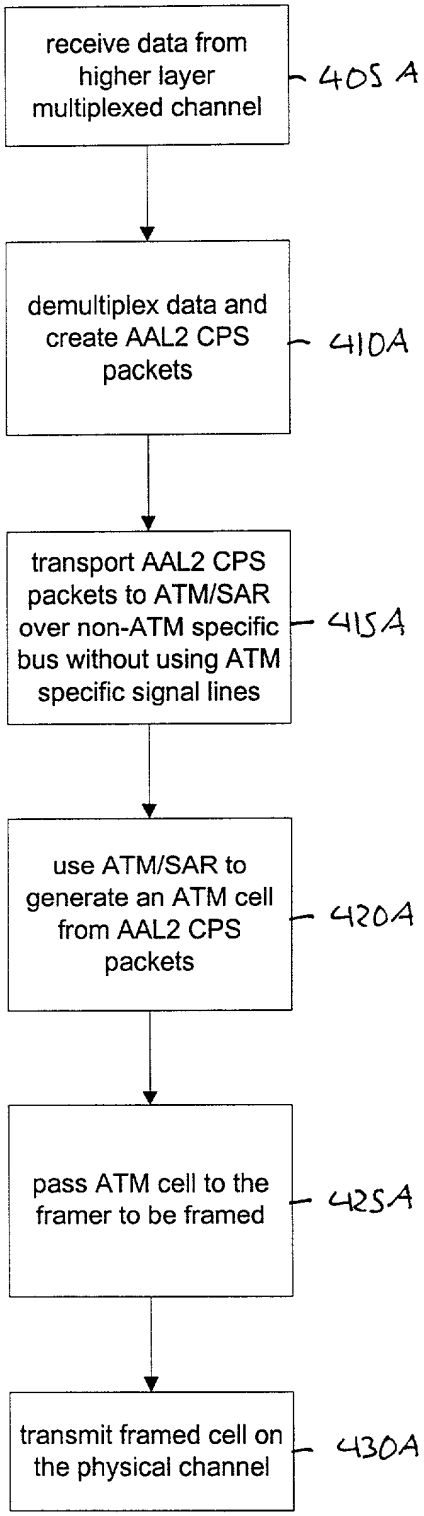
receive data from higher layer multiplexed channel
405A
demultiplex data and create AAL2 CPS packets
410A
transport AAL2 CPS packets to ATM/SAR over non-ATM specific bus without using ATM specific signal lines
415A
use ATM/SAR to generate an ATM cell from AAL2 CPS packets
420A
pass ATM cell to the framer to be framed
425A
transmit framed cell on the physical channel
430A

Fig. 4A

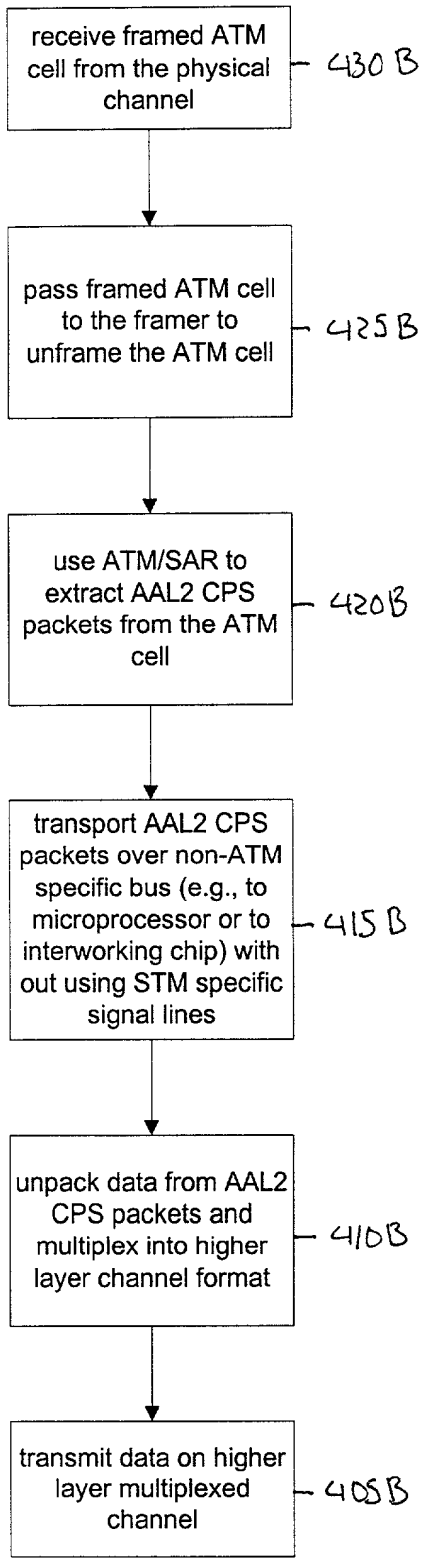
receive framed ATM cell from the physical channel
430B
pass framed ATM cell to the framer to unframe the ATM cell
425B
use ATM/SAR to extract AAL2 CPS packets from the ATM cell
420B
transport AAL2 CPS packets over non-ATM specific bus (e.g., to microprocessor or to interworking chip) with out using STM specific signal lines
415B
unpack data from AAL2 CPS packets and multiplex into higher layer channel format
410B
transmit data on higher layer multiplexed channel
405B

Fig. 4B

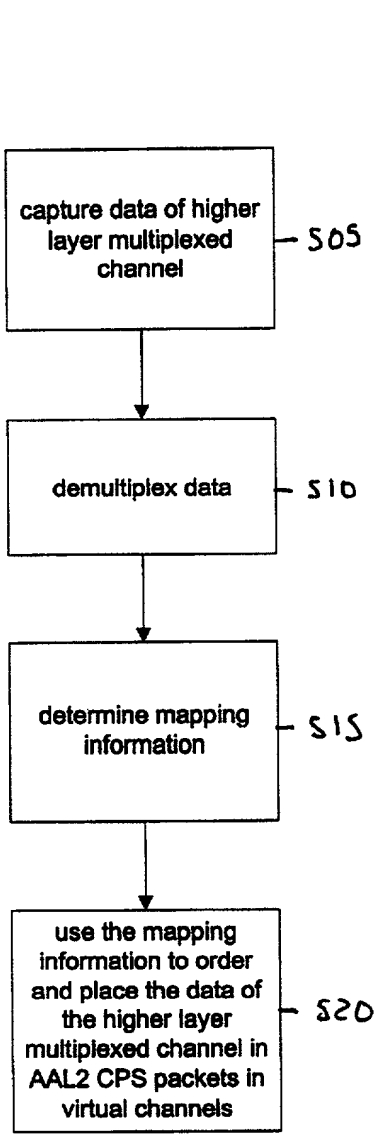
410A
capture data of higher layer multiplexed channel
505
demultiplex data
510
determine mapping information
515
use the mapping information to order and place the data of the higher layer multiplexed channel in AAL2 CPS packets in virtual channels
520

Fig. 5

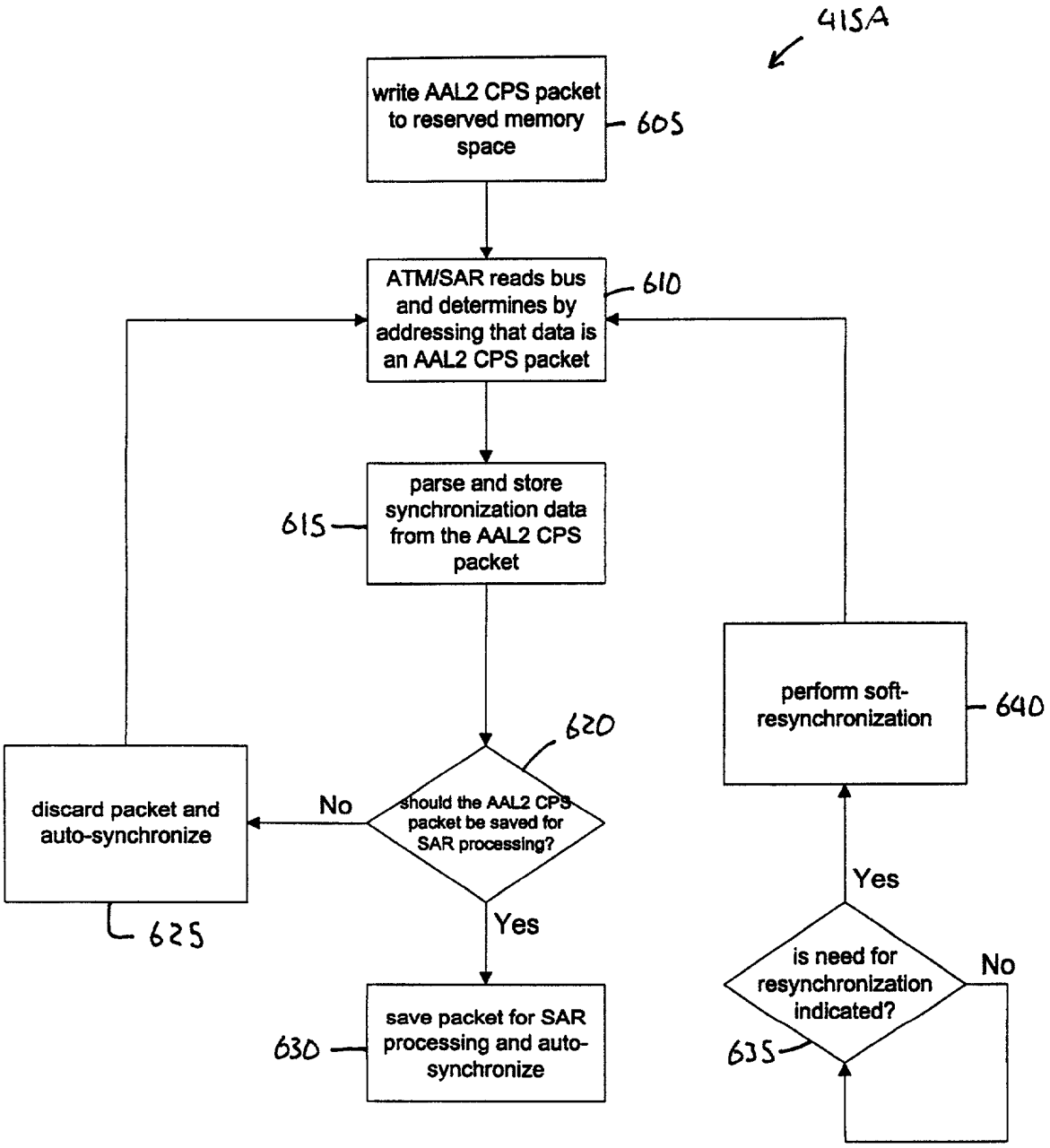
415A
write AAL2 CPS packet to reserved memory space
605
ATM/SAR reads bus and determines by addressing that data is an AAL2 CPS packet
610
parse and store synchronization data from the AAL2 CPS packet
615
620
should the AAL2 CPS packet be saved for SAR processing?
No
discard packet and auto-synchronize
625
Yes
save packet for SAR processing and auto-synchronize
630
perform soft-resynchronization
640
Yes
is need for resynchronization indicated?
No
635

Fig. 6

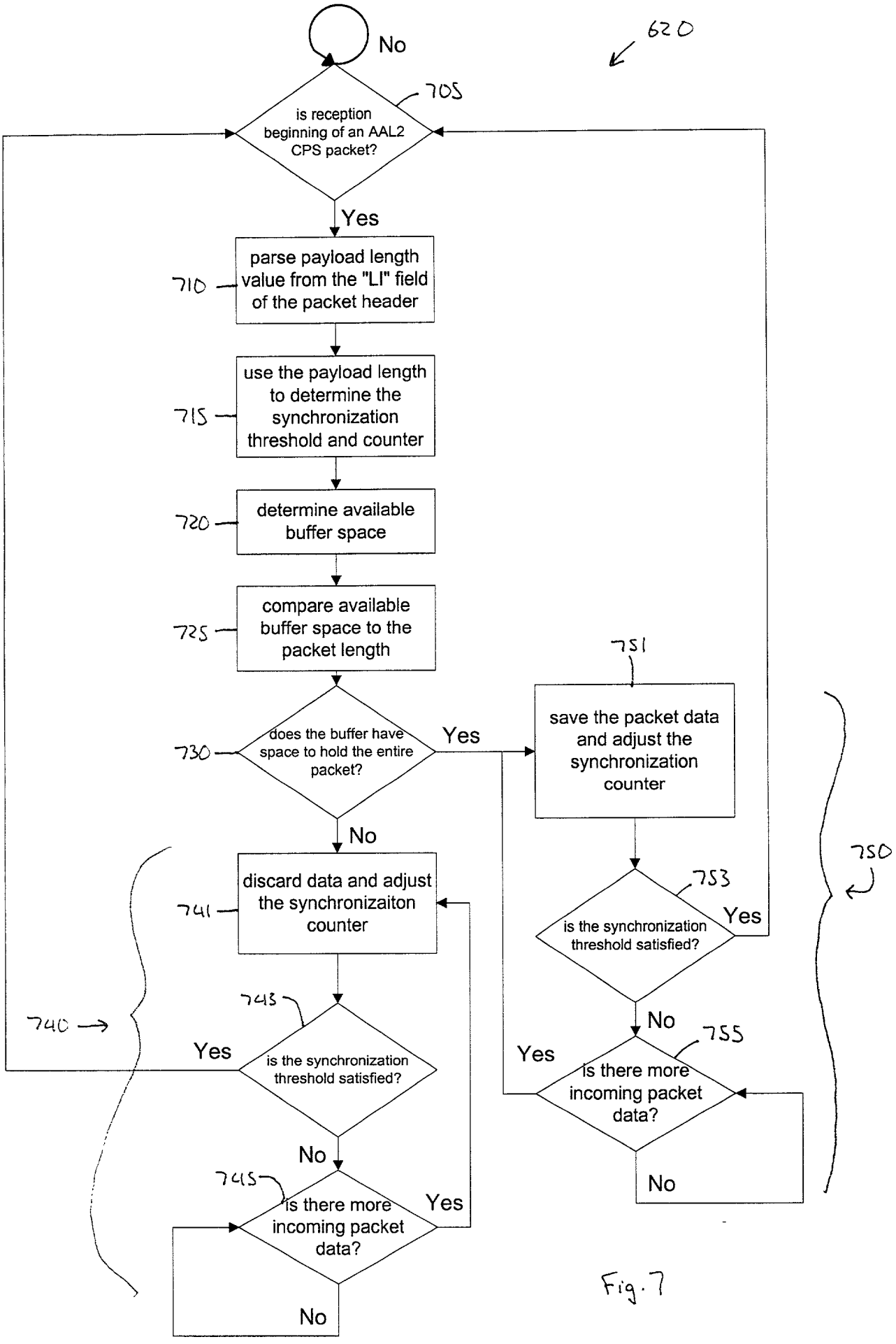
620
No
705
is reception beginning of an AAL2 CPS packet?
Yes
710
parse payload length value from the "LI" field of the packet header
715
use the payload length to determine the synchronization threshold and counter
720
determine available buffer space
725
compare available buffer space to the packet length
730
does the buffer have space to hold the entire packet?
Yes
No
751
save the packet data and adjust the synchronization counter
753
is the synchronization threshold satisfied?
Yes
No
755
is there more incoming packet data?
Yes
No
750
741
discard data and adjust the synchronizaiton counter
743
is the synchronization threshold satisfied?
Yes
No
740
745
is there more incoming packet data?
Yes
No

Fig. 7

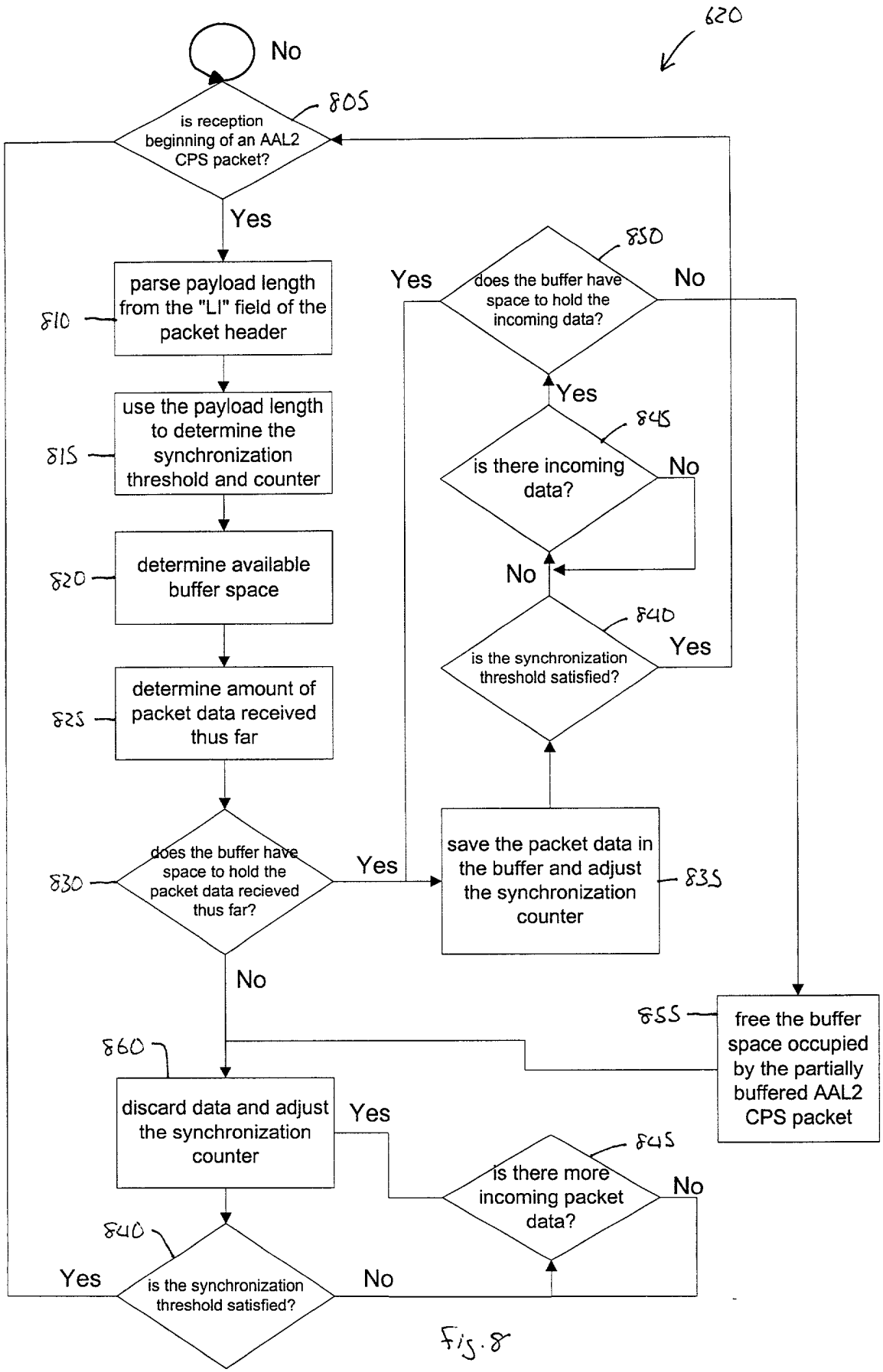
620
No
805
is reception beginning of an AAL2 CPS packet?
Yes
810
parse payload length from the "LI" field of the packet header
815
use the payload length to determine the synchronization threshold and counter
820
determine available buffer space
825
determine amount of packet data received thus far
830
does the buffer have space to hold the packet data recieved thus far?
Yes
No
835
save the packet data in the buffer and adjust the synchronization counter
840
is the synchronization threshold satisfied?
Yes
845
is there incoming data?
No
850
does the buffer have space to hold the incoming data?
Yes
No
855
free the buffer space occupied by the partially buffered AAL2 CPS packet
860
discard data and adjust the synchronization counter
Yes
845
is there more incoming packet data?
No
840
is the synchronization threshold satisfied?
Yes
No

Fig. 8

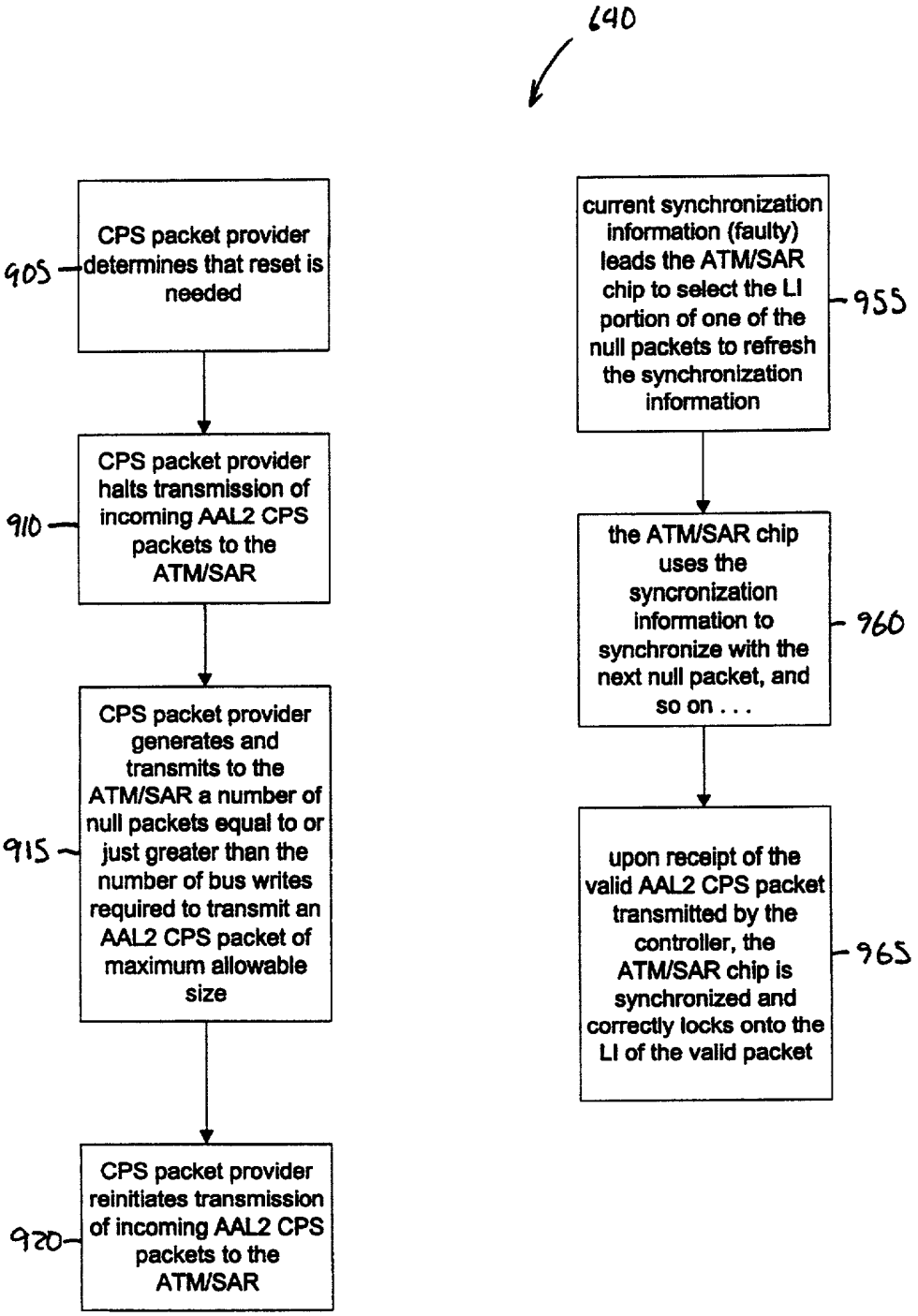
640
CPS packet provider determines that reset is needed
905
CPS packet provider halts transmission of incoming AAL2 CPS packets to the ATM/SAR
910
CPS packet provider generates and transmits to the ATM/SAR a number of null packets equal to or just greater than the number of bus writes required to transmit an AAL2 CPS packet of maximum allowable size
915
CPS packet provider reinitiates transmission of incoming AAL2 CPS packets to the ATM/SAR
920
current synchronization information (faulty) leads the ATM/SAR chip to select the LI portion of one of the null packets to refresh the synchronization information
955
the ATM/SAR chip uses the syncronization information to synchronize with the next null packet, and so on . . .
960
upon receipt of the valid AAL2 CPS packet transmitted by the controller, the ATM/SAR chip is synchronized and correctly locks onto the LI of the valid packet
965

Fig. 9A

Fig. 9B

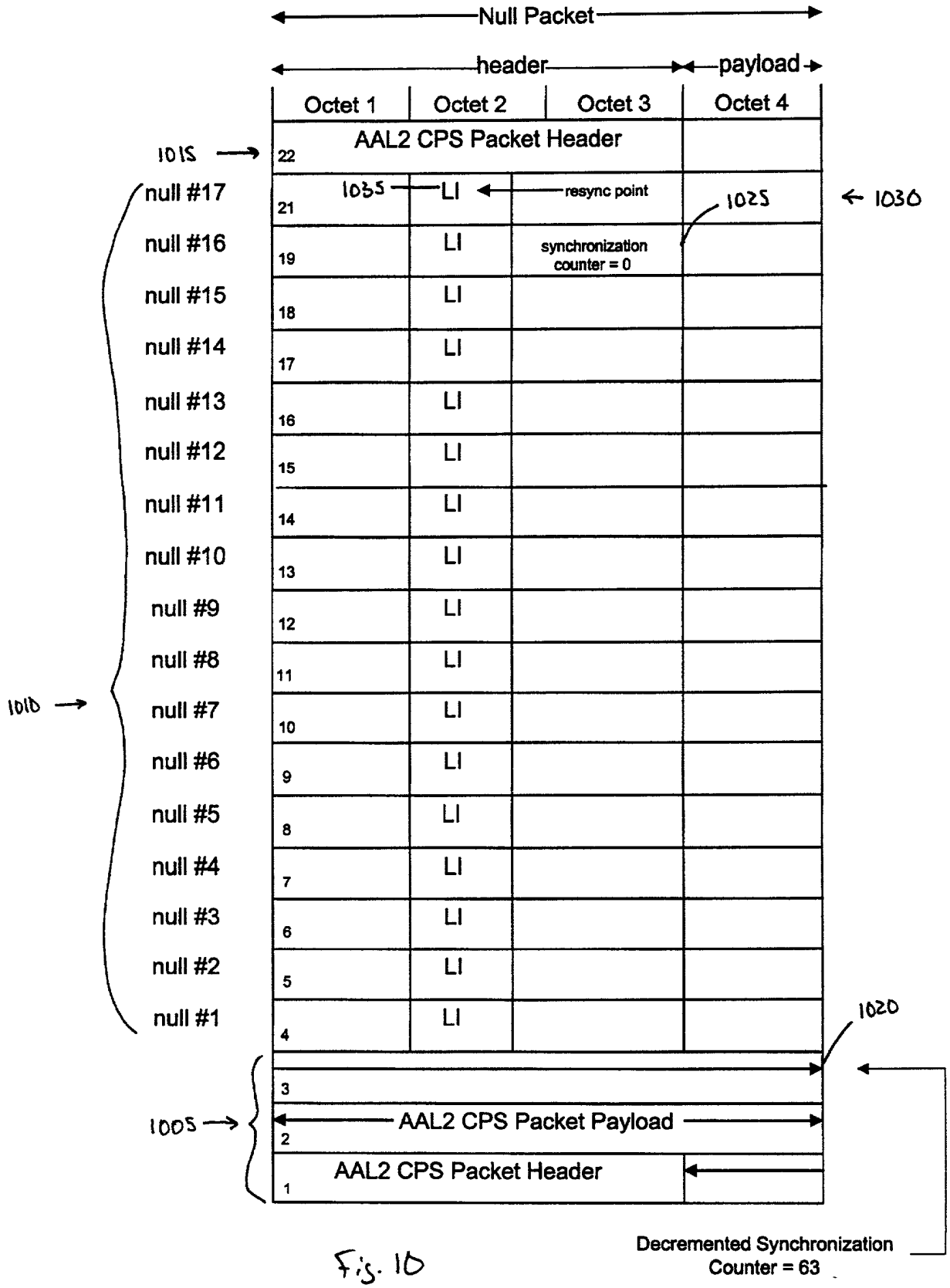
Null Packet
header
payload
Octet 1
Octet 2
Octet 3
Octet 4
1015
22
AAL2 CPS Packet Header
null #17
21
1035
LI
resync point
1025
1030
null #16
19
LI
synchronization counter = 0
null #15
18
LI
null #14
17
LI
null #13
16
LI
null #12
15
LI
null #11
14
LI
null #10
13
LI
null #9
12
LI
null #8
11
LI
1010
null #7
10
LI
null #6
9
LI
null #5
8
LI
null #4
7
LI
null #3
6
LI
null #2
5
LI
null #1
4
LI
1020
3
1005
AAL2 CPS Packet Payload
2
AAL2 CPS Packet Header
1
Decremented Synchronization Counter = 63

Fig. 10

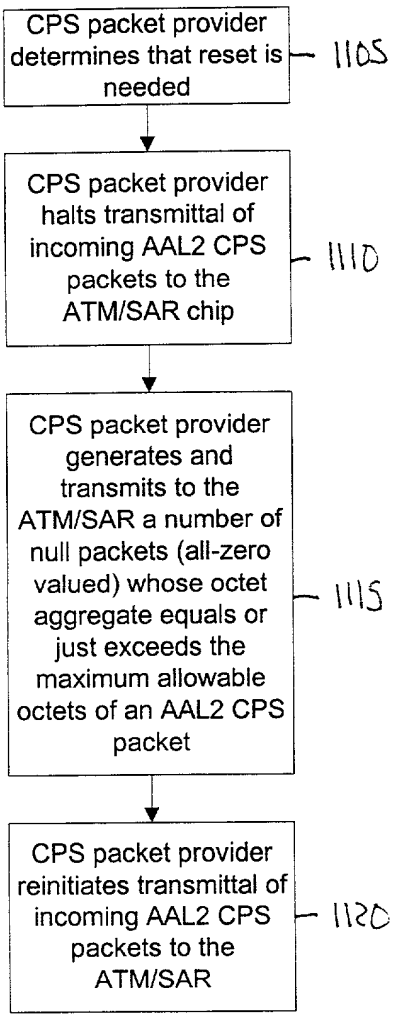

Fig. 11A

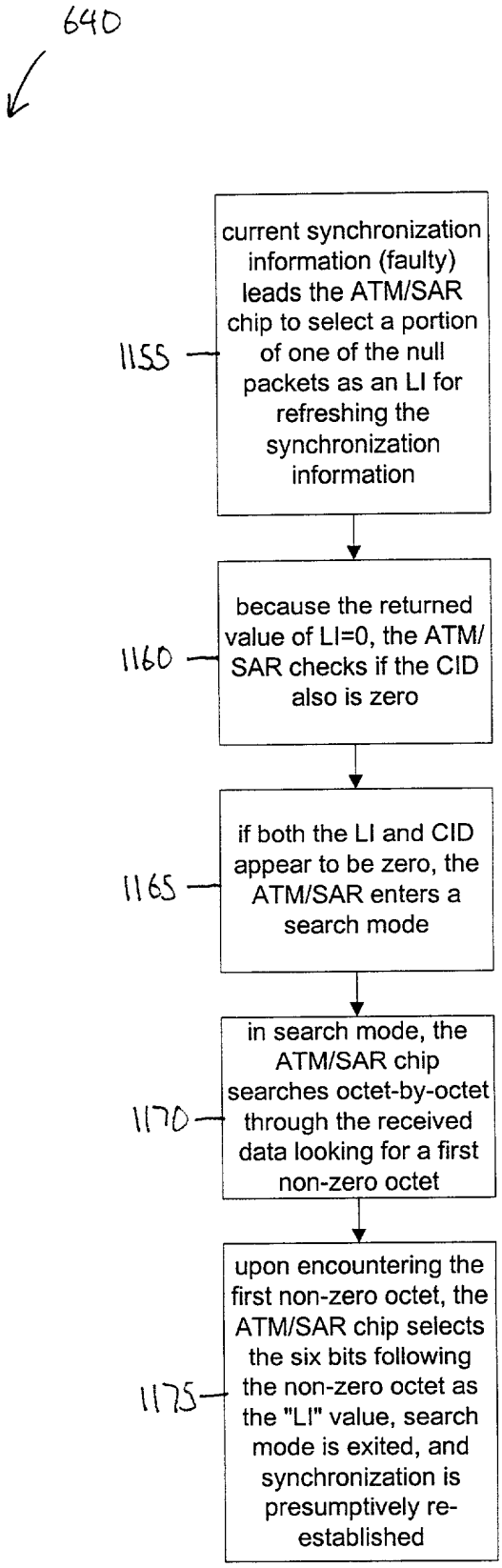

Fig. 11B

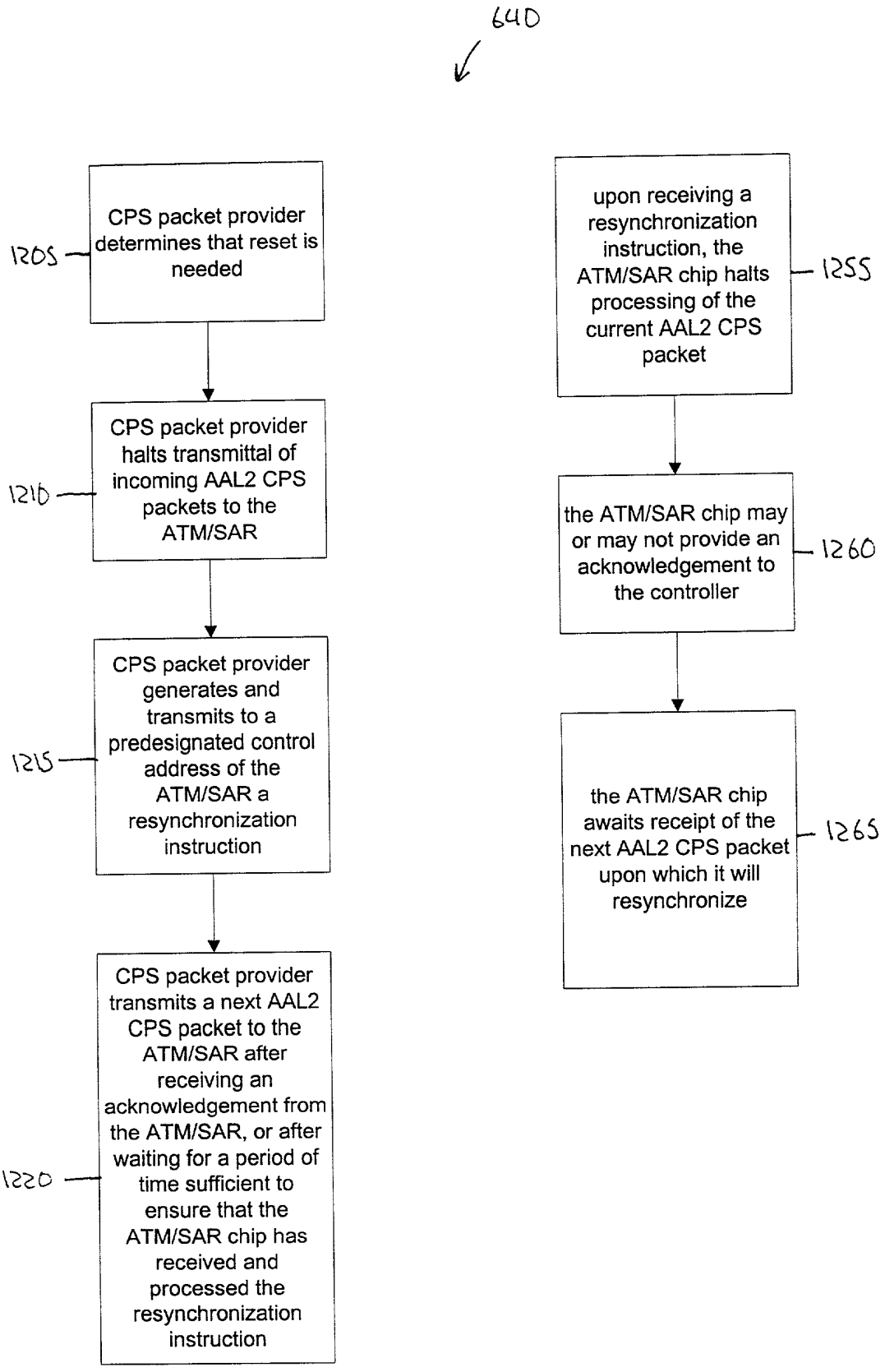

Fig. 12A

Fig. 12B